

Claims

- 1 1. A system for transmitting signal packets, each of the packets having a destination address,
2 from a source to two or more destinations, the system comprising:
 - 3 a router having at least two address groups, said router coupled to receive packets, and to
4 map each packet destination address to one of the address groups; and
 - 5 a tunnel source having an input coupled to said router and having an output and wherein
6 for the packets having an original destination address which belongs to the first address group of
7 said router, the tunnel source assigns each packet it receives to one of a plurality of addresses,
8 each address being associated with a tunnel destination wherein each one of the tunnel
9 destination addresses is mapped to an output channel and wherein for packets having an original
10 destination address belonging to the second address group of said router are mapped onto a single
11 output channel based upon their original address.
- 1 2. The system of claim 1 wherein a new address of a packet is based upon the state of the
2 output channels.
- 1 3. The system of claim 1 wherein a new address of a packets is based upon Quality of
2 Service requirements.
- 1 4. The system of claim 1 where a new address of a packet is based upon traffic demands.
- 1 5. The system of claim 1 wherein:
 - 2 said tunnel source corresponds to an IP tunnel source; and
 - 3 said tunnel destination corresponds to an IP tunnel destination.
- 1 6. A method for transmitting signal packets from a source to two or more destinations, the
2 method comprising:

3 receiving a plurality of packets in a router, each of the packets having a destination
4 address,
5 mapping the destination address of each packet to one of a plurality of address groups in
6 the router; and
7 for each packet, determining to which of the plurality of address groups in the router an
8 original destination address of the packet belongs;
9 in response to the original destination address of the packet belonging to a first address
10 group of the router, assigning each received packet to one of a plurality of addresses, each
11 address being associated with a tunnel destination address with each one of the tunnel destination
12 addresses being mapped to an output channel

1 7. The method of claim 6 wherein in response to the original destination address of the
2 packet belonging to a second address group of the router, mapping the original destination
3 address of the packet onto a single output channel.

1 8. The method of claim 6 wherein assigning each received packet to one of a plurality of
2 addresses includes assigning an address of a packet based upon the state of the output channels.

1 9. The method of claim 6 wherein assigning each received packet to one of a plurality of
2 addresses includes assigning an address of a packet based upon Quality of Service requirements.

1 10. The method of claim 6 wherein assigning each received packet to one of a plurality of
2 addresses includes assigning an address of a packet based upon traffic demands.

1 11. The system of claim 6 wherein:
2 said tunnel source corresponds to an IP tunnel source; and
3 said tunnel destination corresponds to an IP tunnel destination.

1 12. An address allocation method comprising:

2 originating a packet at a first source address S, each of the packets having a destination
3 address D wherein address D is an element of an address space F;
4 receiving the packet at a tunnel source wherein the tunnel source is coupled to a cable
5 modem termination system (CMTS) via an interface having a first IP address (T1);
6 determining in the tunnel source that the packet has a destination address D which is an
7 element of an address space F;
8 in response to the tunnel source determining that the packet has a destination address D
9 which is an element of an address space F, dividing the packet into a plurality of sub-packets;
10 encapsulating each of the plurality of sub-packets, each of the encapsulated sub-packets
11 having a source address and a destination address which define a tunnel between the tunnel
12 source and a tunnel destination;
13 mapping each tunnel destination address onto a corresponding one of a plurality of cable
14 channels; and
15 routing the encapsulated sub-packets via the appropriate tunnel to the tunnel destination.

1 13. The method of claim 12 further comprising:
2 receiving the encapsulated sub-packets at the tunnel destination;
3 combining the channels to provide the original packets; and
4 forwarding the packets in their original order to the destination.

1 14. The method of claim 13 wherein combining the channels comprises removing the
2 encapsulation headers from each of the encapsulated sub-packets to again provide the original
3 packets.

1 15. The method of claim 14 wherein encapsulating comprises:
2 generating a new packet having a payload field;
3 placing the original packet in the payload field of the new packet; and
4 adding a new packet header to the new packet with the new packet header having a source
5 address corresponding to the address T1 and a destination address corresponding to one of a
6 plurality of separate IP interfaces on the tunnel destination and wherein the destination address is

- 7 part of an L address space and wherein each address pair formed by the source address of the new
- 8 packet header and the destination address of the tunnel defines a separate tunnel.